

CLAIMS

1. A method for manufacturing an elastomer mixture for manufacturing rubber, comprising:
metering at least one elastomer to be processed for manufacturing the elastomer mixture into a mixing extruder; and
mixing and plasticizing and/or masticating the elastomer as the elastomer passes through the mixing extruder, the elastomer being present in a uniformly distributed form in a first fluid medium while being charged into the mixing extruder.
2. The method according to claim 1, wherein the first fluid medium is a solvent in which the elastomer is present in dissolved form.
3. The method according to claim 2, wherein the elastomer is present as an emulsion of an elastomer solution in a liquid not miscible with the solvent.
4. The method according to claim 1, wherein the elastomer is present as a suspension of elastomer particles in a liquid.
5. The method according to claim 1, wherein the elastomer is present as a gel-like compound in a solvent.
6. The method according to claim 1, wherein the mixing extruder is a tightly meshing multi-screw extruder having screws that rotate in the same direction.
7. The method according to claim 1, wherein a reinforcing material is added to the elastomer dispersed in the first liquid medium before charging in the mixing extruder.

8. The method according to claim 1, wherein a reinforcing material is added to the elastomer dispersed in the first liquid medium via charging in the mixing extruder.
9. The method according to claim 7, wherein the reinforcing material added to the elastomer is present as a suspension in a second fluid medium.
10. The method according to claim 9, wherein the reinforcing material added to the elastomer is prepared via wet milling in a device before being metered into the mixing extruder.
11. The method according to claim 10, wherein the suspension of reinforcing material is wet milled in a gap between two coaxial rotating elements, which are rotated relative to each other around a shared axis, and generate a shearing field in the gap between the coaxial rotating elements.
12. The method according to claim 11, wherein the two coaxial rotating elements are a respective cylinder and cone, or a respective cone, configured so that the gap between the coaxial rotating elements narrows or expands in a product conveying direction.
13. The method according to claim 12, wherein one of the rotating elements is a rotor, and another of the rotating elements is a stator.
14. The method according to claim 13, wherein pin-like elevations extend from a surface of a respective rotating element in the gap, moving by each other as the rotating elements rotate, and colliding with suspended particles of the reinforcing material.
15. The method according to claim 14, wherein the gap incorporates collision elements that collide with the surface and/or the pin-like elevations of the rotating elements as well as with the

suspended particles of reinforcing material during relative rotation of the rotating elements.

16. The method according to claim 10, wherein wet milling takes place with a centrifugal mill.
17. The method according to claim 1, wherein additional components for the elastomer mixture are at least partially charged in the extruder.
18. The method according to claim 17, wherein the additional components are selected from a group consisting of: fillers, additives, vulcanizing agents, accelerators, softeners and aids:
19. The method according to claim 17, wherein only filler is charged in the mixing extruder in addition to the elastomer to be processed.
20. The method according to claim 17, wherein no crosslinking agents are charged in the elastomer mixture.
21. The method according to claim 18, wherein a product temperature in the mixing extruder is kept under a vulcanizing temperature at least on a side opposite a conveying direction from a metering point when metering vulcanizing agent into the product.
22. The method according to claim 21, wherein the components and reinforcing material in the mixing extruder are incorporated and/or comminuted and/or distributed in the elastomer.
23. The method according to claim 1, wherein the product in the mixing extruder is degassed.
24. The method according to claim 9, wherein the first and/or the second fluid medium is at least partially removed from the product in at least one dewatering step as it passes through the mixing extruder.

25. The method according to claim 24, wherein the first and/or second fluid medium is removed before charging a vulcanizing agent in the mixing extruder.
26. The method according to claim 24, wherein the first and/or second fluid medium is removed in several dewatering steps as the product passes through the mixing extruder.
27. The method according to claim 26, wherein the filler is incorporated in several incorporation steps as the product passes through the mixing extruder.
28. The method according to claim 26, wherein the incorporation steps and dewatering steps alternate in succession.
29. The method according to claim 28, wherein only as much product is removed from the first and/or second fluid medium during a dewatering step as required to ensure desired incorporation for an ensuing incorporation step.
30. The method according to claim 29, wherein one or more dewatering steps take place at one or more lateral openings in a direction of product passage along the mixing extruder, wherein another lateral extruder is arranged on the at least one lateral opening of the mixing extruder, conveying toward and emptying into this at least one lateral opening.
31. The method according to claim 1, wherein the product is reacted with a coagulant.
32. The method according claim 1, wherein the product is molded as it exits the mixing extruder.
33. The method according to claim 32, wherein the molded product is granulated.

34. The method according to claim 32, wherein the molded product is heated along a vulcanization path in such a way that polymers continuously crosslink.
35. A device for executing the method according to claim 1, comprising:
 - at least one charging area for receiving an elastomer; and
 - a mixing extruder with at least one mixing area.
36. The device according to claim 35, wherein the mixing extruder is a multi-screw extruder.
37. The device according to claim 36, wherein the mixing extruder is a ring extruder.
38. An elastomer mixture manufactured using the method according to claim 1.
39. The elastomer mixture according to claim 38, wherein the elastomer mixture is present in dried and granulated, free-flowing form.
40. The method according to claim 1, wherein the elastomer mixture is a compound.
41. The method according to claim 7, wherein the reinforcing material is at least one of soot and silicate.
42. The method according to claim 8, wherein the reinforcing material added to the elastomer is present as a suspension in a second fluid medium.